

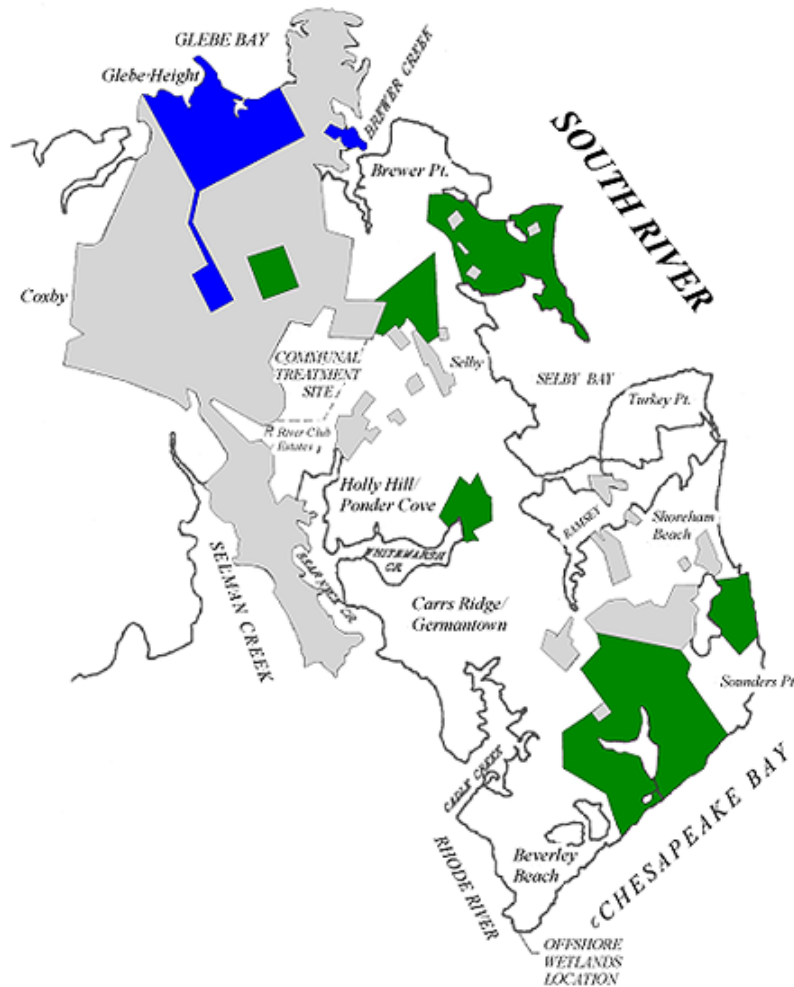


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# National Decentralized Water Resources Capacity Development Project

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## Executive Summary



## Cluster Wastewater Systems Planning Handbook

Lombardo Associates, Inc.  
Newton, Massachusetts

August 2004

# **Cluster Wastewater Systems Planning Handbook**

**Submitted by Lombardo Associates, Inc.  
Newton, Massachusetts**

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National Decentralized Water Resources Capacity Development Project  
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Final Report, August 2004

## **DISCLAIMER**

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The preparation of this handbook benefited from many contributors. Joel Groves assisted in the application of the innovative Geographical Information Systems (GIS) needs analysis that enables a precise definition of needs and thereby permits an optimal solution strategy to be developed—by knowing the problem in precise detail, the appropriate solutions became clearer. Page Fallon and Paul Marin of ECS Marin in Haddam, CT, prepared the Hydrogeology section of Chapter 2 and understood the wastewater dispersal/water resource connection, which is important. Randall Arendt of Narragansett, RI provided the Land Use and Growth Management section along with input from Steve John of Environmental Planning and Economics Inc. in Decatur, IL. Nancy Farrell and the team of Regina Villa Associates, Inc. in Boston, MA prepared the Public Participation section and provided final version editing services. Cheenu Srinivasa of Kalkunte Engineering Corporation in Stoughton, MA assisted with the Wastewater Management Technology chapter. To these project participants, my heartfelt thanks and gratitude.

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## ABSTRACT

The *Cluster Wastewater Systems Planning Handbook* is an executive roadmap for the successful planning, design, and implementation of cluster wastewater systems within the full range of application types, including:

- Community-Wide Decentralized Wastewater Management
- Parcel Development
- Solution to an Existing Defined Wastewater Need

The handbook includes a manual of practice with specific case studies and examples to illustrate critical concepts and techniques.

Cluster wastewater systems can serve a small to large number of connections (two to hundreds of structures). Smaller cluster systems serving a few structures resemble onsite systems, while large cluster systems serving hundreds of structures tend to resemble centralized systems. Cluster systems generally disperse wastewater in subsurface dispersal systems, although surface discharge or water reuse is also practiced. Smaller cluster systems are permitted by health departments, while larger systems are permitted by state environmental protection departments.

The handbook outlines a comprehensive wastewater management planning process that enables communities and property owners to assess where and how cluster systems are appropriate. This process enables the development of an optimized decentralized wastewater management plan. The handbook outlines the planning steps:

1. Initial Data Collection and Preparation of a Community Profile
2. Needs Definition
3. Alternatives Screening and Development of a Final Preferred Solution Plan
4. Development of a Management and Implementation Plan

The challenges of advanced wastewater treatment are discussed, including:

- Nitrogen and phosphorus removal and disinfection
- Indirect water reuse
- Soil and hydrogeological issues
- Growth management and integration with land-use planning
- Regulatory issues

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*Abstract*

How these factors impact and are integrated within the planning process are discussed in detail, especially in Chapter 3.

The handbook provides technical and planning information on cluster wastewater system management and technologies to assist planners, engineers, property owners, and other stakeholders in developing and implementing cluster wastewater systems; however, the handbook is not a comprehensive guide to the engineering of cluster wastewater systems. For more information on particular issues, a wide variety of relevant leading publications and resources produced by the US EPA and other public and private sources are referenced throughout the handbook.



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